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A SYSTEM FOR STORING ORGANIC CHEMICALS

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In every laboratory where considerable work with organic synthetic chemicals is carried on, it becomes necessary to maintain a large stock of organic chemicals. The storing and arranging of many bottles of varying sizes in a limited space often present a problem when a general stock of chemicals is arranged in alphabetical order. Some of them may be displaced, and bottles of the same chemical may be scattered among several laboratories of any organization.

Several years ago the writers devised a system of storing chemicals that made them easy to find, economized on space, and allowed for expansion. As the system has been used successfully for several years, it appears to be worthy of description.

The arrangement consists in placing all bottles of approximately the same size together and, for the sake of convenience, in keeping liquids on separate shelves from the solids. The cabinets are of steel with movable shelves, which are adjusted to give just enough room for removing bottles of a certain size and height, thus using all available space to maximum advantage.

The bottles are arranged on the shelves without regard to order. They are placed in rows one behind the other as far as the depth of the shelves will allow. The number of bottles in a row varies from two or three to as many as ten, depending upon the size. With the bottles of 2-ounce size or smaller it is advisable to separate the rows with strips of cardboard about 1-1/2 inches high and cut to the depth of the shelf. This keeps the bottles from sliding out of place. When a shelf is not completely filled by bottles of one size, the remaining space is left vacant to allow for storing new bottles of this size. Thus the system is flexible, since new shelves may be added when necessary.

It has been found impractical to store extra-large containers of chemicals in the cabinets. A separate store room is set aside for them, with a number of wooden shelves built to conform to the various sized containers, which are arranged in the same way as the small bottles. It is advisable to store volatile acidic compounds, such as acid chlorides, in separate cabinets from volatile basic compounds, such as amines, to avoid coating the shelves with reaction products. All sealed glass ampoules are also stored together.

As a means of identifying the bottles so that they can be found quickly, each shelf is marked by a letter of the alphabet, starting with

A at the top and going down. A small gummed label is attached to each bottle under the regular name label. Each bottle on a shelf is numbered, starting with the first bottle in the first row on the left, going from front to back, and then continuing on to the next row. For example, the bottles on shelf A are labeled A1, A2, A3, etc., those on shelf B, B1, B2, B3, etc. Since there are more shelves than there are letters in the alphabet, after the Z shelf is reached, the alphabet is repeated but the numbers are put before the letters--1A, 2A, 3A, etc. If more shelves are needed the letters can be doubled--AA1, AA2, etc.

An alphabetical card index is used to find any chemical on the shelf. For this purpose plain white 3 x 5 cards are used. The workability of this system hinges on the care with which these cards are prepared and how they are arranged, since no chemical can be found without consulting them. In order to make certain that no bottle was missed, the cards originally were typed in the order that the bottles were on the shelves, starting from A1 and going through the entire series.

In every case the name of the chemical is copied exactly as on the label. In using the index, consideration should be given to possible variations in naming compounds. Cross-index cards are made when bottles of the same compound are labeled differently. Where there are a number of bottles of the same chemical, all are listed on one card. Isomers, such as ortho, meta, and para, normal and iso, and salts of a parent substance are also listed on the same card. In this way the index is not too bulky and permits rapid estimation of the approximate amount of any chemical on hand. A typical index card is shown herewith.

o-AMINOPHENOL					
C9	C47	H37	H51	V23	E82
	oxalate				
U35	6W				
m-					
C46	D47	D74			
p-			HCl	HCl	HCl
C10	C48	V26	A2	22B	FF35

The name of the compound, in this case o-aminophenol, is typed at the top of the card. Directly underneath, the numbers of all bottles containing this compound are listed across the card from left to right. Thus, the card indicates that there were seven bottles of o-aminophenol and one of the oxalate. The bottles of each isomer are listed similarly on the same card. Salts of the compounds are indicated by writing HCl, H_2SO_4, oxalate, etc., directly above the numbers of the bottles concerned.

To determine whether o-aminophenol, for example, is available, the alphabetical index is consulted. It would show that there are seven bottles of the compound in stock, in the places on the shelves represented by the numbers. When a chemist removes a bottle from the shelf, he places his initials in pencil in the space directly under the number of the bottle he takes out. When he finishes using the chemical, he replaces it in its correct place on the shelf and erases his initials from the card.

It is advisable for one person to maintain the system and order the chemicals; otherwise it is difficult to keep an accurate check on the stock.

When a chemist uses up a chemical, he returns the empty bottle to the person in charge. The number on the bottle is crossed off the card and placed on a separate list, so that when another chemical is obtained in a bottle of the same size the number and the space on the shelf can be used over again.

This system also can be used to advantage in filing away vials containing small quantities of compounds prepared in the laboratory. For this purpose filing-cabinet sections containing a number of drawers about 1-1/2 inches deep (so-called "legal sections") are very useful. In each drawer vials of one size are arranged lying down in rows, and each row is separated from the next by a strip of cardboard to prevent the vials from slipping when the drawer is opened. Each drawer and vial is given a code number similar to those on the bottles on the shelves, and an index card is prepared for each compound.

The system has been found to be very flexible. It can be expanded to meet the requirements of any laboratory and will save the chemist a considerable amount of time in hunting for chemicals. The laboratory that uses a large variety of chemicals can also effect a worthwhile saving by avoiding duplication of chemicals and purchase of unnecessary quantities of perishable compounds.